A HEDONIC APPROACH TO RADIATION CONTAMINATION DAMAGES

MORITA Hatsuru*

Abstract
The hedonic method is an econometric tool to calculate implicit evaluation of environmental factors by employing the fact that preference of residents is capitalized into housing price. This paper utilizes the change of land price after the radiation contamination caused by the accident at the Fukushima Dai-ichi Nuclear Power Plant to calculate the amount of damages under Japanese tort law. The paper argues that the hedonic estimates can be used not only as proprietary loss of land owners but also as nonproprietary loss of residents in the radiation contaminated area. The hedonic method can be employed in other environmental nuisance cases, such as noise nuisance lawsuits and air pollution lawsuits.

I. Introduction
The accident at the Fukushima Dai-ichi Nuclear Power Plant which followed the March 11, 2011, earthquake in Japan has emitted huge amounts of radioactive materials, which caused widespread contamination in eastern Japan (Fig. 1). Many residents who live in the radiation contaminated area are suffering various difficulties. Since the purpose of tort law is to internalize externality of harmful behaviors, thereby deterring socially inefficient behaviors, it is desirable that tort law should cover all damages that were caused by the Fukushima accident.

However, the tentative compensation draft for the Fukushima accident by the government committee at the Ministry of Education, Culture, Sports, Science and Technology (MEXT) (hereinafter Tentative Draft)¹ and the Tokyo Electric Power Co., Inc.’s (TEPCO) guidelines which were published in accordance with the Tentative Draft (hereinafter TEPCO guidelines)² are quite restricted. The Tentative Draft and the TEPCO guidelines cover only those damages caused by the governmental evacuation orders, such as evacuation cost, property damages, life and casualty losses, business losses, and losses caused by rumors. They do not include voluntary evacuation cost, decontamination cost, and nonproprietary damages outside of the
governmental evacuated areas.

We cannot say that the damages covered by the Tentative Draft and the TEPCO guidelines are the only damages that were caused by the Fukushima accident. Although we can expect voluntary evacuation cost and decontamination cost outside of the governmental evacuated areas to be covered in the government committee’s final guideline, nonproprietary damages outside of the governmental evacuated areas have not come up for sufficient debate in the government committee. Among others, younger children who live in the contaminated areas are vulnerable to radiation contamination and are suffering enormous mental hardship. They cannot play outdoors and are forced to stay indoors even on hot summer days. In addition, their parents are experiencing stress both for themselves and because they must take care of their children. Excluding these nonproprietary damages would lead to socially undesirable tort law.

This paper proposes a novel way to compensate these nonproprietary damages by employing the hedonic method which has been developed in econometrics. The paper argues that the estimated decrease of land price caused by radiation contamination...
contamination can be used not only as proprietary damages (real estate damages), but also as a convenient proxy of nonproprietary damages. The rest of the paper is organized as follows. First, section 2 provides a brief overview of the hedonic method and its limitation. Then in section 3, the paper discusses various legal problems which arise when the hedonic method is incorporated in the traditional tort law system. Finally, section 4 gives several concluding remarks.

II. Hedonic Method

1. Hedonic Method

(1) What is Hedonic Method?

When we want to know the price of goods (products or services), the most convenient way is to observe a market for the goods. However, for some environmental factors, such as clean air and tranquility, we usually do not have any explicit market and cannot know their price directly. In such cases, Rosen (1974) argued that we can know the price of such factors indirectly — by utilizing a principle called the hedonic method.

Let us suppose that the quality of a house \( Q \) depends on a set of characteristics \( (q_1, q_2, \ldots, q_n) \). Then the quality of a house is a function of the characteristics:

\[
Q = Q(q_1, q_2, \ldots, q_n)
\]

Furthermore, the price of ith house is also determined by its characteristics and can be written as a function of the characteristics:

\[
P_i = P(q_1, q_2, \ldots, q_n)
\]

If we want to know the implicit marginal price of a factor \( q_j \), the partial derivative \( \partial P / \partial q_j \) gives the answer. Rosen (1974) also showed that the implicit marginal price is equal to an individual consumer’s “marginal willingness to pay (MWTP)” in a competitive housing market. In this way, even when there is no explicit market for the factor \( q_j \), we can know its price.

We could say that utility which arises from the factor \( q_j \) is capitalized into the housing price. To put it another way, Tiebout-like “voting by foot” determines the price of the factor \( q_j \).

(2) Source of Bias

Although the hedonic method is widely known and has been employed in many countries, it has several drawbacks. Among others, the hedonic method is susceptible to two sources of bias: unobserved omitted variable biases and self-selection bias.

With respect to unobserved omitted variable bias, the housing price is correlated not only with environmental factors, whose effect we want to estimate, but also with other factors. Let us suppose we want to estimate the effect of air pollution on housing price. Air tends to be heavily polluted in urban areas because of urbanization and industrialization, where housing prices also tend to be high because of those same factors. The common causes drive up both air pollution level and housing price, so that simple regression of housing price on air pollution level shows positive correlation — higher air pollution correlates with higher housing price. Of course, this correlation is superficial, and the true causation is actually the opposite: higher air pollution correlates with lower housing price since normal residents prefer clean air to polluted air. This example shows how the omission of unobserved variables can bias the
estimates seriously.

The second difficulty is self-selection bias. Heterogeneity of preference usually exists among individual market participants, both sellers and buyers. For example, individuals with higher valuations for clean air sort out from areas with worse air quality into better air quality, while individuals with lower valuations for clean air sort out from areas with better air quality into worse air quality. Then the distribution of preference and the amount of sorting behavior can affect the estimates either positively or negatively. 5

(3) Identification Strategy
In order to account for the above mentioned biases, we need to consider various identification strategies. For example, Chay and Greenstone (2005), who tried to estimate the effect of the Clean Air Act on housing price, adopted several econometric techniques.

To detect the omitted variables biases, they adopted the instrumental variable (IV) strategy. They chose the Clean Air Act’s attainment/nonattainment status of middle year as an IV. Since the attainment status affects the contamination level several years after the attainment decision, but the housing price is not correlated with the status, the status can be a candidate of IV. They also confirmed their identification strategy by employing other strategies, such as regression discontinuity design (RDD) and matching. These three identification strategies brought robust results, and they showed that clean air quality is correlated with higher housing price.

With respect to the self-selection biases, they adopted random coefficients. To be precise, they included two control functions, which accounted for both the omitted variables biases and the self-selection biases. Using this identification strategy, they showed that there did exist heterogeneity and self-selection biases, but that the amount of the biases was not serious.

(4) Radiation Contamination of Fukushima
In contrast to the usual hedonic method using housing price, the omitted variables biases are not a serious problem in the case of the radiation contamination by the Fukushima Nuclear Power Plant. The degree of radiation contamination depends on geography, direction of wind, and weather at the time of radiation emission, such as on March 15 and March 21. None of these factors are correlated with housing price and other control variables, so we can say that the radiation contamination level is orthogonal to the dependent variable, housing price. In essence, the degree of radiation contamination is exogenous to relevant variables, and we can consider it as an excellent natural experiment. Additionally, we can expect that simple cross-section analysis can reveal the marginal willingness to pay for the radiation contamination.

However, we may need to account for self-selection biases by employing econometric techniques, such as the control function approach adopted in Chay and Greenstone (2005). Sorting behavior does exist in the Fukushima area: many younger children and their parents have fled from the radiation contaminated area of Fukushima. At the same time, this may not be a serious problem, as in the case of Chay and Greenstone (2005), where they found self-selection bias but determined that the amount of the bias was not large.

As to the area of study, we should include only the Naka-dori area of Fukushima (basin area), not the Hama-dori area (coastal area). The Hama-dori area was heavily hit by the March 11 tsunami, which makes it difficult to separately identify the radiation contamination effect from the tsunami effect. The evacuation area is also to be excluded, since we want to estimate the effect of
radiation contamination only, not the effect of the governmental evacuation order. The evacuation order by the government must have forced housing prices downward.

2. Estimation Strategy

(1) Model Specification
Considering the problems discussed in the previous subsection II.1, a possible specification in order to indentify the effect of radiation contamination would be as follows. Since what we want to know is the effect of radiation contamination on land price,\(^7\) difference-in-difference technique with matching is a suitable estimation strategy. This simple regression can circumvent the problem of the omitted variable biases.

In addition, in order to account for many other factors which may affect the land price, it is desirable to match cities which are similar except for the degree of radiation contamination. Cities in Akita, Iwate, and Yamagata prefectures could be good candidates for matching. In contrast, Miyagi cities, especially Sendai, and Aomori cities may not be suitable. Sendai is not suitable because there exists the “straw effect” in the Tohoku region: the Tohoku region is connected by the Shinkansen (super express railway), and both industry and population are concentrated in Sendai, while industry and population tend to decrease in other cities of the Tohoku region. As to Aomori prefecture, the Shinkansen was extended to Shin-Aomori in December 2010, which has caused an increase of land price in Aomori prefecture. Therefore, if we matched Fukushima cities with Sendai or Aomori, then the estimate would not reveal the effect of radiation contamination, but rather the results of the straw effect or the extension of the Shinkansen.

(2) Variables
Next we need to discuss which variables to pick up. First, with respect to the dependent variable, which is land price, the current market price is the most desirable data. However, current market price of land is available only in the Tokyo area, and there is no such data regarding other regions of Japan. Possible alternatives include official land price (Koji Chika), benchmark land price (Kijun Chika), and land tax assessment price (Rosenka). Since land tax assessment price is determined according to official land price (usually around 70% of the latter), the former is not a good alternative.

Although there is an excellent database of official land prices and benchmark land prices, there are several problems when we employ either price. First, official land price and benchmark land price are considerably lower than current market price. Second, there is a time-lag between the change of current market price and the change of official land price or benchmark land price. The change of current market price is only gradually incorporated into official land price or benchmark land price. Considering these two problems, there must be a significant downward bias when we employ official land price or benchmark land price as the dependent variable.

In addition, Fukushima is a rural area, so local community ties and blood ties still remain strong. Therefore, population mobility in Fukushima is quite low, and the land trading market in Fukushima seriously lacks liquidity. As such, it will take a considerable amount of time for the change of radiation contamination level to be incorporated into land price. Considering this possibility, even though official land prices and benchmark land prices are published yearly, a simple one-year difference-in-difference may not reveal the full impact of the change of radiation contamination level. It would be better to compare
differences over more than two years.\footnote{8}

As to explanatory variables, it is easy to acquire data of radiation contamination levels.\footnote{9} Other control variables include economic conditions, demographic conditions, and neighborhood conditions. The age structure of each city is especially important, since younger children are more vulnerable to radiation contamination and a younger age structure leads to larger decreases in land price.

\textbf{(3) Back-of-the-Envelop Calculation}

Although it is not yet possible to gather all the data mentioned above, we can try a back-of-the-envelop calculation. Since benchmark land price, whose reference date is July 1 of each year, is already published, we can easily compute the difference-in-difference-in-difference (triple difference) estimator of radiation contamination.

Here we select Fukushima city (the capital of Fukushima prefecture) and Morioka city (the capital of Iwate prefecture) as a matching pair. We pick up all the points from the two cities\footnote{10} and compare the changing rate of their land price in 2009, 2010, and 2011. Then we calculate a simple average of the changing rate of both cities. The result is shown in Table 1.

| Table 1 Changing Rate of Land Price |
|-------------------------------|------------------|------------------|
|                               | 2009 → 2010      | 2010 → 2011      |
| Fukushima city                | −3.41\%          | −7.02\%          |
| Morioka city                  | −7.09\%          | −6.48\%          |

Assume that there is no difference between Fukushima city and Morioka city other than the radiation contamination level. Then the land price of Fukushima city would have shown the same change as that of Morioka city. Since the decreasing rate in the land price of Morioka city has slowed slightly (0.5\%) in the period from 2010 to 2011, we would expect the same change to happen in Fukushima city if Fukushima city did not have the radiation contamination. Then, without the radiation contamination, we could expect that the land price of Fukushima city would show a $2.91 = −3.41 + 0.5\%$ decrease from 2010 to 2011. However the real decrease is $−7.02\%$ and we can infer that the difference of $−4.11\%$ is caused by the radiation contamination.

Many readers would be surprised by the small estimate of $4.11\%$, since the land price could have fallen much more dramatically. The smallness of the estimate is probably caused by the low liquidity of the Fukushima land trading market and the time lag between the change of current market price of land and its incorporation into benchmark land price. Therefore this estimate is biased heavily downward, and we can expect that the true impact on land price is much larger. However, we can still employ the estimate as a simple reference point: if the awarded damages are lower than this estimate, then we can safely insist that the amount of damages is too low. In other words, this estimate sets the minimum for the amount of damages.

\section{III. Incorporation into Tort Law}

By employing the hedonic method discussed above, let us suppose we have found a statistically and economically significant decline of land price which has been caused by the radiation contamination. At this stage, there are two ways to incorporate such a decline of land price into the traditional tort law system. One way is to consider the decline as proprietary loss, and the other is to consider it as a proxy of nonproprietary loss. The remainder of this section discusses each strategy in
However, before moving on to the discussion of the two strategies, we need to pay attention to the dual nature of the hedonic estimate. Since we think that the hedonic estimate works as a proxy of nonproprietary loss because that nonproprietary loss is capitalized into proprietary loss, the hedonic estimate has a dual nature: proprietary loss and nonproprietary loss at the same time. Then, if a victim were compensated for both proprietary loss and nonproprietary loss, she would enjoy double compensation for essentially the same damage. Such a double compensation should be avoided, since double compensation would lead to overcompensation and suboptimal overdeterrence, which is socially undesirable.

Therefore, we need to consider how to exclude double compensation. For example, let us suppose a victim has received compensation for her proprietary loss. Then she is not qualified for nonproprietary compensation. If she had already received compensation for her nonproprietary loss, she should be obliged to reimburse the overlapping part of the two compensations.

1. Proprietary Loss

First, we analyze the possibility of incorporation as proprietary loss. The traditional tort law doctrine of Japan defines damages as the difference between the state before the misconduct and after the misconduct. Since the hedonic estimates discussed in 2.1 correspond to the difference of land price before the radiation contamination and after the radiation contamination, it seems quite natural to consider the hedonic estimates as tort damages.

However, there can arise a couple of counterarguments. First, traditional tort law doctrine adopts the brick-by-brick style strategy in calculating damages, which means damages are calculated by accumulating individual realized losses (outflow of money) which the victim has paid out or missed. The hedonic estimates are still unrealized losses and are not recognized as damages by traditional tort law doctrine. Although traditional tort law doctrine does not explain why it adopts the brick-by-brick strategy, we could imagine that the brick-by-brick strategy is a rational strategy to avoid double compensation.

Let us suppose a resident who lives in the radiation contaminated area receives compensation for the decline of her land valuation. Then she decontaminates the land and seeks indemnification for the decontamination cost. If she receives compensation for the decontamination cost, then it leads to double compensation for materially identical property loss. In contrast, if she is not qualified to receive compensation for unrealized property loss, then she is compensated only for the decontamination and no double compensation happens. If this procedural efficiency exceeds the substantive efficiency of full compensation, then the brick-by-brick-strategy, which does not recognize unrealized property loss, can be understood as a rational legal rule.

Second, the hedonic estimate is just a mean and does not describe the exact loss of each individual land. Since estimation errors caused by unobserved variables inevitably occur, we cannot entirely avoid overcompensation or undercompensation in each case. However, this may not be a serious problem because such estimation errors cannot be avoided in the case of usual calculation of damages. If such estimate errors were not allowed, then some of the usual damages calculations would become invalid, too.

2. Nonproprietary Loss

As discussed in the previous subsection, several counterarguments may be presented against
considering the hedonic estimate as unrealized proprietary loss. Then we should consider the possibility of employing the hedonic estimate as a proxy of nonproprietary loss. In this way, those residents who do not own land and are just tenants, as well as land owners, can receive compensation. The residents who do not own land have not suffered proprietary loss, but they do suffer mental distress from the radiation contamination. The distress is caused not by ownership of the contaminated land, but by living in the radiation contaminated area. By employing nonproprietary loss, it is possible to consider mental distress in the context of tort law.

The mental distress caused by radiation contamination can be considered as personal interest, which is different from proprietary interest in traditional tort law. Nonproprietary loss, which corresponds to infringement of personal interest, is subject to the court’s discretion. Since the way residents evaluate the radiation contamination is capitalized into land price, the change of land price can be seen as a good proxy for nonproprietary loss. We can think of several alternatives to incorporate the hedonic method into nonproprietary loss under tort law doctrine. A tentative proposal is as follows.

Hypothesize the typical size of a family house, which is larger on average in the Fukushima area than in the Tokyo area because of the difference of land price level. Then calculate hypothetical decline of land price, which is presumed to be the nonproprietary loss of a family. Since this is only a rough proxy, a comprehensive and uniform lawsuit, which is allowed by a Supreme Court decision, is suitable.

Of course, other proposals can be possible. For example, if we want to account for the heterogeneity of preference among the residents, families with younger children must suffer more than families without any children and should qualify for higher compensation. To account for the heterogeneity, we compute the ratio of families with younger children to the total of all families; families without younger children are not qualified for nonproprietary loss, while families with younger children are qualified for nonproprietary loss multiplied by the inverse of the ratio. Since this is a rather extreme proposal, we can think of many other variants of nonproprietary loss calculation formulae.

Although it is possible to calculate nonproprietary loss as discussed so far, several issues remain to be analyzed, as discussed below.

(1) Problem of Underestimation
The first problem of employing the hedonic method as a proxy of nonproprietary loss is the possibility of underestimation. First, as mentioned above, the land trading market of Fukushima is illiquid, and it is expected to take much longer for the change of utility of residents to be capitalized into land price. As such, a simple hedonic estimate may systematically underestimate the real effect of the radiation contamination. Considering this possibility, we need to be cautious when using the hedonic method as a proxy of nonproprietary loss. It is much safer to employ it as a minimum standard for nonproprietary loss.

Second, the land price level differs greatly between urban areas and rural areas. For example, the land price level of Tokyo is much higher than that of Fukushima. It follows that the hedonic estimate can be much lower in Fukushima than in Tokyo. Then the residents of Fukushima may receive lower compensation than those of Tokyo even though the former suffer more serious radiation contamination than the latter. If we consider that the loss of Fukushima residents and Tokyo residents should be the same, this result may not be justifiable.

However, a similar problem arises in the
case of life and casualty loss, where damages are determined by the income level of the victim. The difference is caused by the accumulation of human capital; it does not mean that the intrinsic value of human life is different but that the monetary valuation of human life varies among different people. By applying the same logic in the case of the hedonic method, the difference among areas can be justifiable.

(2) Coverage of Nonproprietary Loss

Another important issue is the coverage of the hedonic estimate. Since double compensation needs to be avoided, if a victim receives compensation for nonproprietary loss through the hedonic method, she is not qualified for proprietary loss that substantively overlaps the nonproprietary loss she has already received.

In order to consider this issue, it is useful to remember the assumption of the hedonic method that disutility from living in the radiation contaminated areas is capitalized into housing prices. Then what we estimate by the hedonic method is the disutility from living in the radiation contaminated area, which allows us to conclude that proprietary loss caused by the same disutility needs to be excluded in order to avoid double compensation. For example, receiving nonproprietary loss and the cost of decontamination at the same time is receiving double compensation in essence and is not allowed.

(3) Future Loss

A similar issue arises in an interesting characteristic of the hedonic estimate. In effect, the hedonic estimate implies compensation for future loss, which is generally not allowed in Japanese tort law. Just as stock price incorporates future earnings, future (dis)utility of living in a house is capitalized into housing price. Considering that the future loss is incorporated into the hedonic estimate, we need to make sure that double compensation can be avoided.

For example, selling a land after receiving compensation for nonproprietary loss does not cause double compensation because the land price is lower than before the Fukushima accident. At the same time, those who come into the radiation contaminated area after the Fukushima accident can purchase lands at lower prices, but they are not qualified for compensation for nonproprietary loss because of the “coming to the nuisance” doctrine. 16

(4) Mitigation Principle

Finally, the issue of mitigation principle can arise. For example, let us suppose a family living in Fukushima city can migrate to Sendai city by incurring costs of 500,000 yen, while the hedonic estimate of nonproprietary loss for the family is 2,000,000 yen. Is it irrational for the family to stay in Fukushima city, and should the family’s compensation be reduced to 500,000 yen by the mitigation principle?

The answer is clearly no. The family’s decision to stay in Fukushima city must be rational because social capital is still very strong in Fukushima city, and migrating out of the city would destroy valuable local ties. This means that the real cost of migration to Sendai city is not 500,000 yen but over 2,000,000 yen. Therefore, there is no room for the mitigation principle, and the family still qualifies for the full compensation of 2,000,000 yen. 17
In order to achieve socially optimal deterrence, it is essentially necessary for tort law to compensate for the whole externality. Traditional loss calculation methods of Japanese tort law are not sufficient to achieve this goal, and a more comprehensive approach is socially desirable. Here the hedonic method can provide a useful tool as a good proxy. Although there are some issues arising from incorporating the hedonic method into the traditional tort law system, many of them can be overcome.

In these concluding remarks, we want to mention a couple of extensions of the hedonic method.

(1) Application to Other Problems
The first issue is the extent of application of the hedonic method. In order to employ the hedonic method, we need a hedonic relationship, where preference of market participants is capitalized into market price. Even if there is no direct market for some environmental factors, preference for the factors can be revealed in the market of other goods. In addition, we need statistically and economically significant effects. In some cases, we cannot collect a dataset, or even when we can construct a dataset, the relevant factor is not important or has only a small effect, and marginal price for the factor may be too small to estimate effectively.

However, when these two conditions are met, we can employ the hedonic method. One promising candidate is noise nuisance, where there has been no established method for determining compensation. In the Osaka-Itami International Airport Case, where the residents around the Osaka Airport sued the airport company and the state for noise nuisance, the Supreme Court decided that nonproprietary loss was 8,000 yen or 3,000 yen per month from January 1965 through January 1970 and 10,000 per month from February 1970 through May 1975. However, the Supreme Court provided no justification for the amount of nonproprietary loss, since the amount is left to the court’s discretion. By employing the hedonic method, we could have calculated nonproprietary loss much more ostensively and effectively.

(2) CBA of Decontamination
The hedonic method can be also employed as a tool of cost-benefit analysis (CBA). After the Fukushima accident, many efforts have been made to decontaminate the radiation contaminated area. However, there is no CBA of the decontamination processes so far. It may be possible to employ the hedonic method as a tool of CBA of the decontamination.

If the cost of decontamination is larger than its benefit as calculated by the hedonic method, then the decontamination process is not efficient. In this case, the mitigation principle requires a reduction in the amount of damages for the victims. In contrast, if the cost of decontamination is smaller than its benefit, then the decontamination process is efficient. In this case, the full cost of decontamination should be compensated by TEPCO.

However, there is one important caveat. As we have discussed above, there is a high possibility of underestimation because of the nature of the available variables and the low mobility of the Fukushima area. Even if the cost of decontamination is found to be larger than its benefit as calculated by the hedonic method, it is not reasonable to conclude that the decontamination process is not worthwhile. We need to be extremely careful when employing...
the hedonic method in CBA.

References

Notes
* Associate Professor, Tohoku University School of Law. I thank Yuko Akitsu, Kentaro Fukumoto, Taro Nakahara, and seminar participants at Economic Analysis of Law Workshop, Tohoku Civil Law Workshop, and Hokkaido University Civil Law Workshop for helpful comments. I also thank the Mitsui & Co., Ltd. Environment Fund for financial support. Author’s contact information: hatsuru@law.tohoku.ac.jp
4 For a brief overview of Tiebout voting, see Mueller (2003), pp. 186-189.
5 The direction of the biases depends on the distribution of preference and the amount of sorting behavior; it is difficult to predict the direction beforehand.
6 For explanation of the econometric techniques cited in the body text, see Angrist and Pischke (2009) and Lee (2005).
7 In Japan, land and house are different property, unlike the United States and other countries where land and house constitute a single property. Since house price is affected by many factors and the house is considered to be just an accessory to the land, we consider only the price of the land, not the price of the house.
8 However, note that extending the time span of comparison could contaminate the estimate since a longer time span means more noise, resulting in a severe trade-off relationship.
9 It is also possible to include a quadratic term and interaction terms.
10 There are 22 points in Fukushima city and 46 points in Morioka city.
13 Note that TEPCO guidelines offer compensation for nonproprietary loss only for those who have lived in the governmental evacuation area. The amount of compensation for proprietary loss is 100,000 or 50,000 yen per month for those who have evacuated and 100,000 yen for those who have taken indoor shelter. Those who live outside of the governmental evacuation area and are still suffering from the radiation contamination are not qualified for nonproprietary loss under TEPCO guidelines.
14 Dec 16, 1981 (Minshu vol 35 no 10, p. 1369) [Osaka-Itami International Airport Case].
15 The cut-off age distinguishing families which are qualified and those which are not can be 7, 12, 18, or another reasonable age.
16 Those who come to the nuisance are not qualified for damages compensation under Japanese tort law. See the Supreme Court decision Dec. 16, 1981 (Minshu vol 35 no 10, p. 1369) [Osaka-Itami International Airport Case].
17 Although we cannot exclude the possibility that there exists some fake non-migrator, it is difficult (or prohibitively costly) to distinguish such people.
19 The Supreme Court decision Dec. 16, 1981 (Minshu vol 35 no 10, p. 1369).